IN THE CLAIMS

Please amend the claims as indicated below. Claims 21 and 22 have been added. All pending claims and their present status are produced below:

1.   (currently amended)   A computer based method of optimizing one of a model, structure, shape or ~~and~~ design representing <u>an aerodynamic structure or a hydrodynamic structure</u> ~~a physical object~~ based on an evolution strategy, comprising:

    describing one of the model, structure, shape ~~and~~ <u>or </u>design representing <u>an aerodynamic structure or a hydrodynamic structure</u> ~~the physical object~~ to be optimized using a parameter set comprising <u>a first number of </u>object parameters;

    creating offsprings of the parameter set by modifying the object parameters, wherein said modifying includes at least one of mutating the object parameters and recombining the object parameters;

    evaluating quality of the offsprings;

    wherein the parameter set comprises at least one strategy parameter representing a step-size of the mutation of associated object parameters; ~~and~~

    ~~adapting~~ <u>modifying said first</u> ~~a~~ number of the object parameters <u>to a second number of object parameters </u>and <u>modifying</u> a <u>first </u>number of associated strategy parameters <u>to a second number of associated strategy parameters </u>during optimization <u>to optimize one of said model, structure, shape or design; and</u>

    <u>storing one of said optimized model, optimized structure, optimized shape or optimized design in a computer storage.</u>

2

2.   (currently amended))   The optimization method of claim 1 further comprising altering the object parameters and the strategy parameters, wherein said altering includes at least one of selectively inserting or ~~and~~ removing an object parameter and a strategy parameter.

3.   (previously presented) The optimization method of claim 2, further comprising estimating a value of a newly inserted strategy parameter based on information of strategy parameters associated with correlated object parameters.

4.   (previously presented)The optimization method of claim 1, further comprising estimating a value of a newly inserted strategy parameter based on information of strategy parameters associated with correlated object parameters.

5.   (previously presented) The optimization method of claim 1, further comprising determining a position of altering an object parameter and an associated strategy parameter using a random function.

6.   (previously presented) The optimization method of claim 5, further comprising determining a time of altering the object parameter and the associated strategy parameter using a random function.

7.   (previously presented) The optimization method of claim 1, further comprising determining a time of altering an object parameter and an associated strategy parameter using a random function.

8.   (previously presented) The optimization method of claim 1, further comprising determining a position of altering an object parameter and an associated strategy parameter by progress of the evolutionary optimization.

9.   (previously presented)The optimization method of claim 8, further comprising determining a time of said altering of said object parameter and the associated strategy parameter by the progress of the evolutionary optimization.

10.   (previously presented) The optimization method of claim 8, further comprising determining a time of said altering of said object parameter and the associated strategy parameter by the progress of the evolutionary optimization.

11.   (original)   The optimization method of claim 1, wherein the mutating of the object parameters does not directly influence the result of the evaluating step.

12.   (currently amended) A computer based method of optimizing one of a model, structure, shape ~~and~~ or design representing <u>an aerodynamic structure or a hydrodynamic structure</u> ~~a physical object~~ based on an evolution strategy, comprising:

4

describing one of the model, structure, shape ~~and~~ or design representing an aerodynamic

structure or a hydrodynamic structure ~~the physical object~~ to be optimized using a

parameter set comprising a first number of object parameters;

creating offsprings of the parameter set by ~~mutating of~~ modifying the first number of

object parameters to a second number of object parameters and modifying a

structure of the parameter set, the structure of the parameter set defined by a

number and position of the object parameters and strategy parameters; and

evaluating quality of the offsprings;

wherein the parameter set comprises at least one strategy parameter representing a step-

size of the mutation of associated object parameters; and

storing one of said optimized model, optimized structure, optimized shape or optimized

design in a computer storage.

13.   (currently amended)   The optimization method of claim 12, wherein said step-

size of the ~~mutation~~ modification is a variance of a normal distribution.

14.   (currently amended) The optimization method of claim 12, wherein said one of

the model, structure, shape, ~~and~~ or design is described using a spline.

15.   (previously presented) The optimization method of claim 14, wherein the object

parameters comprise control points and knot points, the method further comprising adapting a

knot vector by inserting new control points and strategy parameters.

5

16.   (previously presented) The optimization method of claim 15, further comprising estimating values of newly inserted strategy parameters based upon values of strategy parameters of neighboring control points.

17.   (currently amended)   A computer based method for optimizing a spline coded structure <u>representing an aerodynamic structure or a hydrodynamic structure</u> based on an evolution strategy, comprising:

describing the spline coded structure to be optimized using a parameter set comprising <u>a first number of</u> object parameters representing control points and knot points and at least one strategy parameter representing a step-size of a mutation of associated object parameters;

mutating the object parameters and strategy parameters to create offsprings of the set, comprising:

determining a control point insertion,

inserting the control point in the parameter set,

inserting ~~a~~ <u>an additional</u> strategy parameter for the inserted control point,

determining the knot points modified by the insertion of the control point,

determining a weighted averaging of strategy parameter values of modified control points, and

assigning the weighted average value as a value of the inserted strategy parameter; ~~and~~

evaluating quality of the offsprings<u>; and</u>

<u>storing the mutated object parameters and strategy parameters in a computer memory</u>.

6

18.   (previously presented) The method of claim 17, wherein said step-size of the mutation is a variance of a normal distribution.

19.   (currently amended)   The method of claim 1, wherein the model, structure, shape ~~and~~ or design representing <u>an aerodynamic structure or a hydrodynamic structure</u> ~~the physical object~~ comprises one of:

an airfoil;

a spline coded structure;

a turbine blade for a gas turbine;

an aerodynamic structure; <u>or</u> ~~and~~

a hydrodynamic structure.

20.   (previously presented) A computer program stored in a computer readable medium for performing the method of claim 1 .

21.   (new) A computer program stored in a computer readable medium for performing the method of claim 12 .

22.   (new) A computer program stored in a computer readable medium for performing the method of claim 17 .

7